DEMOGRAPHY—SCIENCE AND ADMINISTRATION

By R. R. KUCZYNSKI

1. The Beginnings of Demography

UNTIL ten years ago the word "demography" was rarely used in this country. Population experts, it is true, had attended the International Congresses for Hygiene and Demography, and they studied the *Aperçus démographiques* published by the International Statistical Institute, but the *Concise Oxford Dictionary* still defined demography as "statistics of births, diseases, &c., illustrating condition of communities," while demography, as is evident from the word itself, aims primarily at a description of the population, using, of course, if available, censuses, birth, marriage, death, and migration statistics, and occasionally also statistics of diseases. However, in recent years "demography" has been used more frequently and more correctly, and the University of London even appointed (in 1938) a Reader in Demography.

Demography, like every other science, has to do with methods and with results. A few scholars have been interested only in the development of methods by which the basic data may be correctly interpreted, and the demographer owes much to those pure mathematicians. Among demographers, who are all, of course, interested in interpreting results, a certain number have contributed to the development of methods.

The first man who ever made a demographic study was the London haberdasher John Graunt. His little book *Natural and Political Observations upon the Bills of Mortality*, published in 1662, was a remarkable achievement. His basic material consisted of the weekly London "Bills of Mortality" which showed baptisms by sex and burials by sex, age, and cause of death. He compiled all available Bills and analysed the content of his tables, which covered many decades, most thoroughly and with a vast amount of common sense. He even went so far as to construct a life table for London. This life table, of course, was most primitive and inaccurate—about as inaccurate, I should say, as the recent official life tables for India or for Lagos. His motive for "deducing so many abstruse, and unexpected inferences out of these poor despised Bills of Mortality" was that "the Art of Governing, and the true *Politiques*, is how to preserve the Subject in *Peace*, and *Plenty*."[1] When Graunt published his pamphlet he had not the faintest idea that he had created a new science. Demographic data, he thought, could be useful only to the Administration. "There seems to be good reason, why the Magistrate should himself take notice of the numbers of Burials, and Christnings, viz. to see, whether the City increase or decrease in people; whether it increase proportionably with the rest of the Nation; whether it be grown big enough, or too big, &c. But why the same should be made known to the People, otherwise then to please them as with a curiosity, I see not."[2]

Graunt lived in an enlightened period. The great importance of his work was at once recognized both by the State and by Science. His name appears in the original list of Fellows of the Royal Society, which received its charter in 1662, and Sprat, in his History of the Society, speaks of "the Recommendation which the King himself was pleased to make, of the judicious Author of *the Observations on the Bills of Mortality*: In whose Election, it was so far from being a Prejudice, that he was a Shop-keeper of London; that his Majesty gave this particular Charge to his Society, that if they found any more such Tradesmen, they should be sure to admit them all, without any more ado."[3]

The original list of Fellows contained also the name of Sir William Petty, who wrote *Essays in Political Arithmetick* and other demographic studies.[4] An able disciple of his friend Graunt, he was both more knowledgeable and more brilliant, but his contribution to the development of methods was not important. Edmund Halley, on the other hand, who joined the Society a few decades later, was hardly interested in demography as such, and his whole demographic work covers only eighteen printed pages.[5] His great contribution was the discovery (in 1692) of a most ingenious method of constructing a life table. He was not sufficiently explicit as to his data and the use he made of them, and his method has, therefore, been very often misunderstood. Many of his successors in various countries committed grave errors in trying to apply it, while others introduced slight improvements. But in a general way it may be said that Halley's method was for about 175 years the usual device for constructing life tables.

2. Science and Administration

England was the cradle of demography, and in the two centuries following the publication of Graunt's *Observations* England's contribution to the new science was equal to that of any other country. But the position has since changed. If a list were made of the hundred best demographers who set out on their careers during the last hundred years, it would be very difficult to find five Englishmen to include in it.

The causes of this stagnation in English demography can be easily discerned. In the first place, the number of people engaged in demographic research (full time or part time) is probably smaller now in relation to the population than it was fifty or a hundred years ago. On the Continent their number has increased by leaps and bounds. In England there is one Registrar-General's Office. On the Continent there are, apart from a Central Statistical Office for each country, numerous State and municipal statistical offices. Moreover, in the Registrar-General's Office priority is given to all matters dealing with registration; in the continental statistical offices population statistics are not at such a disadvantage. A Registrar-General is rightly chosen according to his qualifications to function in this capacity, and he may never have dealt with population statistics before his appointment. On the Continent a civil servant becomes director of a statistical office after having worked for many years either in the same or another statistical office, and it is inconceivable that he be appointed without having had experience in population statistics. It may be argued that the Registrar-General has demographic assistants who are in charge of this section of his office's work. But experience shows that this offers no solution of the problem. The Registrar-General George Graham, in 1879, concluded his last annual report by saying: "Lastly, I must express to Dr. Farr, whom in 1842 I had the good fortune to find here presiding over the Statistical Branch, my grateful acknowledgment of the important services he has ever since continually rendered. He is acknowledged throughout Europe, the United States, East Indies and the Colonies as one of the first statists of the day. To his scientific researches and reports I attribute any reputation that may have accrued to the General Register Office of England and Wales from the time he accepted office in this Department."[6] All this was perfectly true. Dr. Farr, in the Statistical Branch, made the best use of the basic data he got from the Registration Branch. But his efforts to improve those data failed. The birth registration form introduced in 1837, when the Registrar-General's Office was created, was quite defective. From a demographic viewpoint it was much less satisfactory than, for example, the birth registration form introduced in Sweden in 1775. Dr. Farr became early aware of that. In his report for 1842 he wrote:

> . . . no provision has yet been made for determining the simplest fundamental facts—the foundation of all reasoning on the subject—such as . . . the ages of mothers of children . . . Upon many of these points the greatest ignorance prevails, writers on population depending on rough approximations derived from scanty, imperfect,

and often erroneous data, because the censuses and registers of Europe have not yet been taken and abstracted upon a comprehensive, well-considered plan.[7]

He made similar complaints over and over again. In his report for 1867 he said:

Two grave defects in the registers of the United Kingdom deprive them of much of their utility as pedigrees, and as records of facts for the solution of the great problems of population. Neither the age of mothers at the births of each of their children, nor the order of birth, is recorded; so that the number of children borne by women at different ages, and in the course of their lives, cannot be ascertained. This defect was supplied in the first schedule of the Scotch Act, but the important parts of the schedule were unfortunately discontinued after 1855.[8]

It is pathetic to read in the Congress reports of the International Statistical Institute the appeals which Dr. Farr made for the registration of the mother's age in all countries keeping birth records.[9] His appeals were not altogether in vain. By 1921 England was practically the only civilized country where this question was not asked. The birth schedule of 1837 remained unchanged until 1938, when Parliament insisted on its reform. If Dr. Farr had been Registrar-General—and it was the great disappointment of his life that he was never promoted to this position—the basic demographic data for many decades would have been as ample in England as in the British Dominions, the United States, France, Germany, Austria, Italy, the Scandinavian countries, etc., etc. As he was second in command his country derived only very limited benefits from the last prominent demographer it has produced. That he accomplished as much as he did was due to the fact that he was not only competent but also obsessed by an urge for research and a deep interest in demography. None of his successors combined these qualities.

Another cause of the deterioration of British demography is the lack of contact between administration and science. On the Continent many directors of statistical offices are at the same time university teachers; they sometimes hold seminars in their office and teach the students the whole process of statistical technique. It is quite usual for such students, after they have terminated their university studies, to be appointed assistants and later directors of municipal or other statistical offices, and to become in their turn university teachers. Nothing of the kind exists in this country. The scholar interested in population problems usually knows very little of the technique of statistical administration; he cannot appraise the technical difficulties and the cost of carrying out the proposals which he may suggest to the administration; he cannot effectively answer the arguments of the civil servant. The administration, on the other hand, focuses its attention on its immediate needs and is, as a rule, reluctant to acknowledge specific legitimate needs of the demographic scholar. This, of course, does not affect the pure mathematician interested in methods but not in results. As a consequence thereof, the foreign reader of a review such as the *Journal of the Royal Statistical Society* must be struck by the high standard of the purely mathematical contributions dealing with a fictitious population, and by the scarcity of demographic papers. The barrier between administration and science deters the British scholar from demographic research; another deterrent is the low standard of the official vital statistics, compelling him to resort to foreign statistics which are difficult to understand without a knowledge of foreign conditions and foreign languages. The general level of demographic doctors' theses submitted to English universities is high, but a demographic study of the authors would probably reveal that comparatively few are born in this country.

3. English Census Statistics

Censuses have been taken regularly every ten years from 1801 up to 1931. These censuses furnish valuable information to demographers, sociologists, economists, geographers, and administrators. I shall deal here only with those data which are of special interest to the demographer. They refer to the sex and age composition of the population, to marital condition, and to fertility. The sex was ascertained from the first

census onwards. The ages of the population were obtained in 1821 and again from 1841 onwards. The marital condition was asked for the first time in 1851, and thereafter at each subsequent census. Questions relating to fertility were put only in 1911.

At the early censuses the omission of persons was apparently frequent, but from 1841 on the censuses in England have probably been as complete as in any other country. This does not mean that the omissions are altogether negligible. There is, for example, a tendency everywhere to leave out young infants, and this tendency is strengthened in England by the habit of delaying the registration of births. Thus the General Report on the 1921 census states:

> It may be observed that the population always comprises a large number of newly born infants whose births have not yet been registered, and that this number may easily have been as high as 50,000 or 60,000 at the date of the census. The attitude of mind which regards such children as not having been placed upon the official roll and not subject, therefore, to the census procedure is an intelligible one . . .[10]

It is impossible, of course, to estimate even approximately the numerical importance of the omissions at various ages, but a guess that they aggregate something like one or two per 1,000 of the total population would probably not be far off the mark. They are offset in part by the erroneous inclusion of persons temporarily abroad and by double counting.

While, then, the English censuses may be considered fairly complete, the demographic details are not as accurate as might be expected. The mistakes in the returns on sex, to be sure, are undoubtedly few. But the age data are less satisfactory. There is in England, as everywhere, a tendency to report age in round numbers—that is, in numbers ending with 0. It may suffice to mention that, according to the 1931 census, there were 245,684 men aged 50, but only 215,999 aged 51; 280,182 women aged 50, but only 240,793 aged 51. Ages ending with the digit 7 are unpopular, while there is a marked predilection for ages ending in 8. According to the 1931 census, there were more men and more women aged 58 than aged 57, more men and women aged 48 than aged 47, more men and women aged 38 than 37, etc. That the age statistics of many other countries are not so defective as those of England is due to the fact that in their census forms they do not ask for the age at the last birthday, but rather for the date of birth. It seems desirable that henceforth England should follow their lead in this respect.

Misstatements of marital condition are also quite frequent. The large excess of married women over married men which appears at every British census can be explained only in part by the fact that the number of married members of the Army, Royal Navy, and Merchant Service who are temporarily abroad exceeds the number of married foreigners who are temporarily in this country and have left their wives at home. It seems that tens of thousands of women report themselves as married though they are not. But a much graver defect is the inadequacy of the statistics of divorced people. Until 1921 all persons over 15 years were asked to state in the census forms whether they were single, married, or widowed. As to divorced persons, it was evidently left to their discretion which of these three alternatives they liked to choose, and if by any chance they were obstinate enough to reveal their actual marital condition they were probably counted as widowed. In 1921 a discreet attempt was made to identify divorced persons. The heading of the column relating to marital condition now read:

> For persons aged 15 and over write "Single," "Married," "Widowed," or if marriage dissolved by divorce write "D."

The innovation was introduced with great reluctance and with the conviction that it would prove to be a failure. The report states:

> At the 1921 census an attempt was made for the first time in this country to ascertain the number of divorced persons in the population . . . The total number returned in this category amounted to 16,682 in all, of which 8,464 were males and 8,218 females . . . It is greatly to be feared, however, that doubts as to the value of such returns, which were felt and expressed when it was first decided to include the inquiry in the general

census questionnaire, have proved only too well founded, for from an examination of the records of the divorces which have been granted year by year, after making full allowance for reductions in the numbers by mortality and by a very high remarriage rate, the expected numbers might well be put at a figure twice as large as the total recorded above, and it appears more than probable therefore that a large number of persons failed to return the desired information.[11]

The number of men reported as divorced was then slightly greater than the number of women. Since the remarriage rate of divorced men is much higher than that of divorced women, misstatements of marital condition must have been particularly numerous among divorced women. According to the 1931 census the divorced males numbered 13,546 and the divorced females 19,169. It will be interesting to read the official comment on these figures in the General Report, which has not been published as yet.

From a demographic standpoint the 1911 census is still to-day the most valuable of all because it included questions concerning fertility. Each married woman had to state the number of years the present marriage had lasted, the number of children born alive to the present marriage, the number of children still living, and the number of children who had died. The question about the duration of marriage was answered incorrectly by a very large number of wives. The tendency to concentrate on round numbers —10, 20, 30, 40—was even more pronounced in the case of marriage duration than in the statement of ages. Moreover, misstatements of short durations were exceedingly numerous. The ratio of couples returned as married 0-1, 1-2, and 2-3 years to the number of marriages concluded in the three years preceding the census was 68, 85, and 89 per cent. respectively, the understatement of the number of couples returned as married under one year being mainly due to a desire to conceal ante-nuptial conception. The instruction to return only the children of the present marriage was often disregarded. On the other hand, many mothers seem to have omitted in their statements children who died young.[12]

The first census embodying fertility questions had been taken in 1875 in Massachusetts, and many other countries followed suit. The decline in the birth rate made, of course, the demand for such enquiries ever more urgent, and between 1920 and 1936 alone fertility censuses were taken in France (1921, 1926, 1931, and 1936), Holland (1920 and 1930), Norway (1920 and 1930), Hungary (1920 and 1930), Estonia (1922 and 1934), Spain (1920 and 1930), Italy (1931), Czechoslovakia (1930), Germany (1933), the Union of South Africa (1921 and 1926), Southern Rhodesia (1921 and 1926), Northern Rhodesia (1921 and 1931), Australia (1921), New Zealand (1921 and 1936). But in this country no such enquiry has been made since 1911.

Another grave defect which must be mentioned in this connection is the date of publication of the English census reports. The fertility enquiry of 1911 was made throughout the United Kingdom. The complete reports for Scotland and Ireland were both published in 1913. For England and Wales a first volume, containing a number of basic tables, was published in 1917; the second volume, containing all other tables and the text, was published in 1923. I have already mentioned that the text volume of the 1931 census is not yet available. The volumes published so far contain merely tables. This, it seems to me, is an intolerable situation which should be remedied and could be remedied easily. I happened to be connected with the United States Census of 1900. The publication of the 1890 census reports had been very slow. But Congress was not willing to run a similar risk again. The Census Act of March 3rd, 1899, provided therefore:

> The only volumes that shall be prepared and published in connection with the Twelfth Census, except the Special Reports hereinafter provided for, shall relate to population, mortality and vital statistics, the products of agriculture, and of manufacturing and mechanical establishments . . . and shall be designated as and constitute the Census Reports, which said reports shall be published not later than the first day of July, nineteen hundred and two.

We then had barely two years for the preparation and publication of the reports,

not only of a most elaborate population census but also of a most intricate census of agriculture and of manufactures, in a country with a population nearly twice that of England and Wales and with an area more than fifty times as large. But we knew that we had to do it, and all the volumes, tables and text, covering nearly 10,000 large, closely printed pages, were published within the prescribed time limit.

4. English Vital Statistics

Civil registration of births, marriages, and deaths was started on July 1st, 1837. The records are probably as complete as in any other country. Birth registration, to be sure, was somewhat defective prior to the introduction of compulsory registration in 1875, but it is safe to say that nearly all children born thereafter have been registered, though often with great delay. Death registration was almost complete from the outset. Marriage statistics, of course, are absolutely complete, since, while people may be born or may die without being registered, there is no marriage without registration. As to accuracy the vital statistics suffer from defects similar to those of the census statistics. The age at death is too often reported in numbers ending with 0. There is also, at least among middle-aged persons, a predilection for ages ending in the digit 2. Here again the remedy lies in asking for the date of birth instead of the age in years.

Until the new Population (Statistics) Act came into force, the Registrar-General's *Statistical Review* showed merely the number of male and female, legitimate and illegitimate live births and still births, registered in each quarter. From July 1st, 1938, on the *Statistical Review* shows in addition the births by order of birth, age of mother, and duration of marriage. The *Decennial Supplement* gives in addition data about fertility by occupation in the period centring around the census. The *Supplement* dealing with the year 1921 was published in 1927 ; the volume which is to cover the years 1930 to 1932 is not available as yet. But the records of the father's occupation are not the only ones of which little use has been made. From 1837 on, the registration form recorded the date of birth and the date of registration. But in the published birth statistics no account (until 1944) was ever taken of the date of birth. We know the number of births registered in a given year, but we do not know the number of births which occurred in that year. According to a statement published year-in year-out in the Registrar-General's *Statistical Review* " the average time lag between occurrence and registration is usually about a month." This seems to indicate that the average time lag is usually though not always about a month. But even if the average time lag were always exactly one month, the difference between the number of registered and of actual births might vary considerably from year to year. It may well be, therefore, that even in peacetime the changes in the official birth figures sometimes convey a distorted picture of the actual changes in natality. The number of registered births dropped from 613,972 in 1932, to 580,413 in 1933, and rose again to 597,642 in 1934. The number of registrations in the last quarter of 1933 (129,810) was over 10,000 lower than in any other quarter from 1850 to this day. It is possible, of course, that the number of births was actually as low in the last quarter of 1933 as indicated by the official statistics. But until there is proof to the contrary it seems safer to assume that the drop in the actual number of births in 1933 was smaller than the drop in the number of births registered in that year. The official birth rates in 1933-7 were 14·4, 14·8, 14·7, 14·8, and 14·9. It may well be that the actual birth rate in 1933 was not lower than in 1935. And which year had the highest birth rate is anybody's guess.

In periods in which rationing of food induces parents to hasten birth registration or de-rationing of food removes this incentive the official birth figures, of course, are absolutely misleading. From 1918 to 1919 the number of registered births (which alone appeared in the official statistics) increased from 662,661 to 692,438 or by only 29,777. Actually, the number of births registered in 1918 was much larger than the number of

births that occurred in that year while the reverse was true in 1919, and the increase in the number that occurred has been estimated at three times the increase in the number of births that were registered. In 1938-40, the numbers of births registered were 621,204, 619,352, and 607,029 respectively. How many births actually occurred in 1938 it is impossible to tell. In 1939 and 1940—according to the *Statistical Review for 1940* (published in 1944)—the numbers were 614,479 and 590,120. It is most welcome that the Registrar-General, who naturally is more interested in birth registration than in birth statistics, has at last yielded to the demographers' urgent demand for dealing with births according to the date of the event, and has published the numbers of male and female legitimate and illegitimate live and still births which occurred in 1939 and 1940. But the statistics for those years, showing order of birth and duration of marriage, unfortunately still refer to registered births and, therefore, do not convey a true picture of the decline in fertility during the first period of the war. These statistics include for 1939 54,144 live births which occurred in 1938 but were registered only in 1939, while they exclude 49,271 which occurred in 1939 and were registered in 1940. The statistics for 1940 include those 49,271 births, but exclude 32,362 which occurred in 1940 and were registered in 1941.

The deaths up to now have likewise been shown by date of registration. But here the consequences are less serious. According to a statement published each year in the Registrar-General's *Statistical Review* "the time lag between occurrence and registration is usually only a day or two." It would seem, however, that the exceptions to this rule are very numerous. Of the twenty-three tables on mortality embodied in the *Statistical Review* one shows the deaths by months of occurrence. A comparison with the returns by date of registration reveals that the differences are sometimes pretty large. From the third to the fourth quarter of 1935, the number of registered deaths increased by 22,677, or 22·7 per cent., while the number of actual deaths increased by 24,785, or 25·1 per cent. It seems desirable, therefore, that henceforth not only the births but also the deaths be classified throughout by date of occurrence.

The Population (Statistics) Act introduced only some questions of minor importance to be asked on the registration of death. But the collection of details about deaths has been fairly ample for many years, and the mortality statistics of England compare favourably with those of other countries. I would even go so far as to plead for the curtailment of the published tables in one respect. I would advocate that the publication of standardized death rates be stopped. The standardized death rate, which is meant to convey a better picture of the trend of mortality than the crude death rate, has decreased from 20 in 1876-80 to 9 in 1935-9. The crude death rate has decreased only from 21 to 12. This crude rate is no adequate gauge of the trend of mortality, as it is calculated without regard to the changes in the age composition of the population. Since the age composition is now more favourable than sixty years ago, the crude death rate overstates the decline of mortality. The official standardized death rates are those which would have been recorded if the age composition of the population had been the same as in 1901. All depends, of course, on what year is taken as a standard, and it so happens that by choosing the year 1901 the decline of mortality in the last sixty years is overstated still more than by a comparison of the crude death rates. To compute what the death rates would have been sixty years ago and what they would be now if the composition of the population by age at both dates had been that of 1901 is perfectly futile. It is just as futile as to compute what would have been the death rates then and to-day if, both in the late seventies and now, the composition of the population by occupation had been the same as in 1901. But the computation of such standardized death rates is not only futile, it is a nuisance. Nothing, I am convinced, has contributed so much to conceal the actual trend of mortality in England as the regular publication of these standardized death rates. The correct

death rate derived from the life tables has decreased in the last sixty years from 23 to 16 or only by about 30 per cent. England, which in the 1880's had a lower mortality than, for example, Germany, Holland, and Switzerland, had in the 1930's a higher mortality than those countries. The time that is wasted in computing misleading standardized death rates could not be better used than in studying why the progress achieved in lowering mortality in England lags behind what has been accomplished in a good many other countries.

The position is particularly unsatisfactory as regards life tables. Thirty years ago such tables were available for 1838-54, 1871-80, 1881-90, 1891-1900, 1901-10, and 1910-12. Since then tables have been published only for 1920-2 and 1930-2. While the earlier tables comprised all years from 1871 to 1912, the recent ones cover only six of the thirty-two years elapsed since 1912. Formerly the bad years were taken with the good years. It is obvious that the results of the new procedure, which completely ignores not only the war years but also such a bad peace year as 1929, are much less conclusive. The existing life tables should be supplemented without delay by a life table for females for 1911-20, and by tables for each sex for 1921-30 and 1931-9. The necessary data are all available in the Registrar-General's Office, and by using modern short-cut methods which yield results sufficiently accurate for all practical and scientific purposes a life table can be computed in a few hours.

The marriage statistics in England are not as ample as the death statistics but they are not as meagre as the birth statistics were until 1938. As in the case of the death statistics it is not so much the tables showing the basic figures which need modification but rather the published rates and averages. The Registrar-General's *Statistical Review* gives the marriage rates of (*a*) bachelors and divorced men, (*b*) widowers, (*c*) spinsters and divorced women, and (*d*) widows. This lumping together of single and divorced persons was immaterial sixty or seventy years ago when the marrying divorced persons numbered only 100 a year and constituted only 0·2 per cent. of the remarrying persons, but it is most confusing to-day, since in 1939 no fewer than 10,698 or 20 per cent. of the remarrying persons had been divorced. One average which is particularly misleading and which is published every year in the *Statistical Review*, is the average age at marriage. This figure was rising before the war and gave the impression that people nowadays marry later than in former times. But it was rising only because the population was ageing. It is obvious that in countries where owing, for example, to a heavy decrease in fertility the proportion of younger spinsters decreases, the average age at marriage may increase, even if the nuptiality of the younger spinsters rises while that of the older spinsters declines. Since 1931 the frequency of marriages in England has increased enormously. Yet the average age at marriage of spinsters rose in every year up to 1937. No wonder that people who see those figures conclude that the increase in the number of marriages was largely due to the contraction of marriages that had been postponed during the depression. But a correct computation of the mean age at marriage of spinsters, that is of the mean expectation of single life at birth for those who eventually marry, shows that it has actually decreased in every year since 1931. The additional marriages concluded in that period were then early marriages, not delayed marriages.

The correct mean age at marriage can be derived only from a nuptiality table which is constructed according to the same principles as a life table, and which shows the probability of marrying. Many official nuptiality tables have been computed in the course of the last forty years in foreign countries, but none in England. Our knowledge of the frequency of marriages, in so far as it is based on official documents, is, therefore, quite defective. As in the case of life tables all necessary data are available in the Registrar-General's Office, and nothing could destroy as quickly the myth that our population problem may be solved by an increase in marriages as the publication of official nuptiality tables.

5. Official Statistics and Population Problems

In February 1944 the Government set up a Royal Commission on Population. Its first term of reference is "to examine the facts relating to the present population trends in Great Britain." Let us assume that, on being appointed, a member of the Commission would have tried to examine the facts by consulting all published official statistics. He would have found that the most recent general census available was the one of 1931 and that the covering report was not yet prepared; that no fertility inquiry had been made since 1911; that all birth statistics were based on the date of registration and were therefore somewhat uncertain; that the most recent statistics of the father's occupation were those of 1921; that no data collected under the Population (Statistics) Act of 1938 had been published so far. If he had looked for gross and net reproduction rates or for nuptiality tables, he would have seen that such rates or tables have never been published and never even been mentioned. If he had asked for any official publication on population trends he would have been given the Registrar-General's White Paper *Current Trend of Population in Great Britain*, of which Earl De La Warr said in the House of Lords on June 8th, 1943: "This Report, if I may say so, is completely misleading and therefore extremely dangerous. I cannot see the reason or excuse for a Report of this character unless it is just an attempt to allay public concern on a problem that is in fact dangerous to the extent that the public do not recognize it." If he had pointed out that the Government in that same discussion had announced that the Minister of Health "proposes to publish a document on the lines of the recent White Paper, in which the statistical outlook would be set out and discussed in a reasoned and balanced manner," he would have been told that the plan to publish such a document had been abandoned.

Since the appointment of the Royal Commission the position has improved considerably.

1. The results of the emergency census taken for purposes of national registration on September 29th, 1939, were published in the spring of 1944. The report shows the civilian population by sex, age, and marital condition. The returns are less trustworthy than those obtained at the general censuses, and the data for men are particularly defective inasmuch as they exclude (for England and Wales) about 900,000 non-civilians; but our knowledge of the age composition and the marital condition of females has become much more up to date.

2. The Government published in the summer of 1944 data for 1940 collected under the Population (Statistics) Act; similar figures for 1939 were published in the autumn of 1944, and shortly thereafter for the second half of 1938.[13] The tables for 1938 are accompanied by a covering report which shows the gross and net reproduction rates for 1938. Unfortunately the text is written in the same vein as the White Paper on current trends of population. The Registrar-General evidently thought that the main object of such a report was to fight what his Medical Statistical Officer called "that lamentable sense of national inferiority from which a large section of the population now seems to be suffering."[14] The essence of his argument is that the population problem is not serious since a population decline could be prevented by encouraging marriage and particularly early marriage. For 1939 and 1940 only tables have been published, but no rates and no text. It is to be feared, therefore, that in their present state these statistics will be of little use to the members of the Royal Commission. However, the basic data are now available, and it should not cause unsurmountable difficulties to relate them to other data hidden in the Registrar-General's Office and to provide an unbiased interpretation of the figures.

3. The Registrar-General, in the spring of 1944, published for 1934-43 "approximate reproduction rates, corresponding to the births which occurred in each year and making allowance for a continuing improvement in survivorship conditions."[15] In his *Statistical Review* for 1938 he had included a net reproduction rate computed according

to the principles accepted all over the world (and adopted by the League of Nations and the International Statistical Institute), which imply that such rates should be computed on the basis of current fertility and mortality. His new rates take no account whatever of current mortality. Although in 1940 fertility was lower and mortality was much higher than in 1935, he obtains for 1940 a higher reproduction rate than for 1935 because, irrespective of the facts, he assumes year-in year-out a steady gradual " improvement in survivorship conditions." These rates are not comparable with those of any other country ; they are speculative because all estimates of future survivorship conditions are uncertain ; they tend to overstate reproduction because they disregard fluctuations in mortality. But if they were recomputed on the basis of current mortality they would be most useful.

A start, no doubt, has been made in the course of the last year to increase our knowledge of the demographic position of England. But much has still to be done in order to enable the Royal Commission " to examine the facts relating to the present population trends." A few things have been suggested before, such as the computation of life tables and nuptiality tables, of gross reproduction rates and of genuine net reproduction rates, and a proper analysis of the statistics collected under the Population (Statistics) Act up to 1944. But the most important task of all is the immediate taking of a special fertility (or family) census which would fill many gaps caused by the numerous sins of omission committed in the course of the last decades. Such a fertility census would convey a comprehensive picture of essential demographic facts upon which (to use Farr's words of 1844) " the greatest ignorance prevails," for example, the incidence of childlessness, the spacing of births, fertility differences between occupational and social groups, and the distribution of families of various sizes. The information to be derived from such a census is indispensable for a serious study of the population problem and for the framing of an adequate population policy.

6. Future of Administration and Science

It may well be that in some very small countries population and vital statistics do not suffer if they are prepared in a Registrar-General's Office, but this combination is to be found in no large country except England, and it has yielded here quite unsatisfactory results. It seems, therefore, advisable to create an independent office dealing with population and vital statistics. Whether such an office should also be put in charge of some other related statistics is not of decisive importance. *The Economist* of October 7th, 1944, contained the following suggestion :

> It is already contemplated to take the census of production each year after the war ; formerly it was taken every five years. There is a strong case for taking a census of distribution at frequent intervals, perhaps every two years. Similarly, the interval between population censuses has been far too long in the past ; it might well be reduced from ten to five years. But if the number of such statistical investigations is to be increased and if they are to be carried out at short intervals, the existing facilities at the disposal of the Government will have to be overhauled. It might be an advantage, for example, to follow American practice by creating an organization analogous to the Bureau of the Census, that is by making a single organization responsible for all censuses. The creation of a strong permanent organization would not merely simplify the procedure, but it should make for speed in the assembly and publication of statistics.

The American Bureau of Census is in fact in charge not only of population censuses but also of vital statistics, and an organization analogous to this Bureau may prove as beneficial here as it has proven in the United States. The only reasonable objection which may be raised against the proposed change is that it would *not necessarily* " make for speed in the assembly and publication of statistics." But it is an incontrovertible fact that for several decades publication of population statistics in this country has been slower than in any British Dominion or Colony or in any foreign country. An outstanding example of speed in publication is to be found in India. The area covered by the Indian census of 1931 was thirty times as large as that of England and Wales, and the population was nine times as large. Yet, the forty-nine volumes of that Indian census

which included an admirable text of several hundred thousand words were published within thirty months after census date. Would anyone suggest that it is easier to take a census in India, that it is easier there to instruct the supervisors and the enumerators (2,000,000 as compared with 40,000 in England), to assemble the filled-up forms at headquarters, or to train the necessary clerical staff for coding, punching, and attending the electric tabulating machines? And would anyone suggest that with the present organization it would be possible here to achieve what has been achieved in India?

Difficulties, it is true, may arise in finding the adequate personnel for the new organization. The leading men should be competent, unbiased, eager, and preferably young. It is here that Science can play an important part. Our universities should establish chairs for demography, and the students of demography should be thoroughly trained in statistics. This training would enable them to find a position as statisticians if they fail to secure employment as demographers. But the demand for demographers will be considerable in the future. The increasing importance of the population problem will afford many opportunities of doing useful work in this country, and the great development schemes in the Colonies cannot be carried out effectively without the assistance of expert demographers.

In the field of demography, as in many other fields, the Administration needs the co-operation of Science. But there is hardly any other field in which Science needs so much the co-operation of the Administration. The demographic scholar can discover methods by which the basic demographic data may be correctly interpreted but he himself cannot collect those data. They can be collected only by the Administration, and his chances of getting the data he needs will obviously be much greater if he contributes towards the education of the future personnel of the Administration.

NOTES

[1] *Natural and Political Observations*, p. 72. London, 1662.

[2] See *ibid.*, p. 12.

[3] Thomas Sprat, *The History of the Royal Society of London, for the Improving of Natural Knowledge*, 3rd ed., p. 67. London, 1722.

[4] See *The Economic Writings of Sir William Petty*, ed. by Charles Henry Hull. 2 vols. Cambridge, 1899.

[5] "An Estimate of the Degrees of the Mortality of Mankind, drawn from curious Tables of the Births and Funerals at the City of Breslaw," *Philosophical Transactions*, vol. 17, No. 196, Jan. 1693, pp. 596-610; "Some further Considerations on the Breslaw Bills of Mortality," *ibid.*, No. 198, March 1693, pp. 654-6.

[6] *40th Annual Report of the Registrar-General of Births, Deaths, and Marriages in England (1877)*, p. xl.

[7] *6th Report (1842)*, p. xxvii.

[8] *30th Report (1867)*, p. 222. See also *14th Report (1851)*, p. xiii; *16th Report (1853)*, p. x; *27th Report (1864)*, pp. xix-xx; *Supplement to 35th Report (1872)*, p. xi.

[9] See, for example, *Congrès International de Statistique à la Haye, Compte-rendu des travaux de la septième session, seconde partie*, p. 533. The Hague, 1870.

[10] *Census of England and Wales, 1921, General Report with Appendices*, p. 78. London, 1927.

[11] *Ibid.*, p. 84.

[12] See R. R. Kuczynski, *The Measurement of Population Growth*, pp. 83-90. London, 1935.

[13] See *Statistical Review for the Year 1938, Tables, Part II, Civil*; same for 1939 and for 1940. London, 1944.

[14] *British Medical Journal*, March 21st, 1942.

[15] See *Births, Deaths and Marriages registered in the Quarter ended 31st December, 1943*, p. 1.